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METHODS OF ASSESSING SCIENTIFIC LITERACY OF PRIMARY STUDENTS

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Annotation: The theoretical foundations, modern methods and practical significance of assessing the scientific literacy of primary school students are highlighted. The role of international assessment programs, in particular TIMSS and PISA studies, in the formation of scientific literacy is analyzed. The effectiveness of assessment methods and innovative approaches used to determine students' knowledge, skills and competencies in natural sciences is also revealed.

Keywords: scientific literacy, assessment methods, TIMSS, PISA, competence, primary education, natural science, monitoring, diagnostics, innovative education.

МЕТОДЫ ОЦЕНКИ ЕСТЕСТВЕННО-НАУЧНОЙ ГРАМОТНОСТИ УЧАЩИХСЯ НАЧАЛЬНОЙ ШКОЛЫ

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Аннотация: Рассмотрены теоретические основы, современные методы и практическое значение оценки естественно-научной грамотности учащихся начальной школы. Проанализирована роль международных программ оценки, в частности исследований TIMSS и PISA, в формировании естественно-научной грамотности. Также раскрыта эффективность методов оценки и инновационных подходов, используемых для определения знаний, навыков и компетенций учащихся в области естественных наук.

Ключевые слова: естественно-научная грамотность, методы оценки, TIMSS, PISA, компетенция, начальное образование, естественные науки, мониторинг, диагностика, инновационное образование.

BOSHLANG'ICH SINF O'QUVCHILARINING TABIIY-ILMIY SAVODXONLIGINI BAHOLASH METODLARI

Termiz Iqtisodiyot va Servis Unversiteti Ta'lim va tarbiya nazariyasi va metodikasi (boshlang'ich ta'lim) yo'nalish 2-bosqich magistranti
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Annotatsiya: Boshlang'ich sinf o'quvchilarining tabiiy-ilmiy savodxonligini baholashning nazariy asoslari, zamonaviy metodlari va amaliy ahamiyati yoritilgan. Tabiiy-ilmiy savodxonlikni shakllantirishda xalqaro baholash dasturlari, xususan TIMSS va PISA tadqiqotlarining o'rni tahlil qilingan. Shuningdek, o'quvchilarning tabiiy fanlar bo'yicha bilim, ko'nikma va kompetensiyalarini aniqlashda qo'llaniladigan baholash usullari hamda innovatsion yondashuvlarning samaradorligi ochib berilgan.

Kalit so'zlar: tabiiy-ilmiy savodxonlik, baholash metodlari, TIMSS, PISA, kompetensiya, boshlang'ich ta'lim, tabiiy fan, monitoring, diagnostika, innovatsion ta'lim.

Introduction

As a result of the fundamental reforms taking place in the world education system, the issue of determining the level of students' knowledge, as well as developing their ability to apply knowledge in practice, is gaining urgent importance. In this regard, the concept of scientific literacy has become an important component of modern education. Scientific literacy represents a person's ability to understand natural phenomena, draw conclusions based on scientific evidence, solve problems, and use scientific knowledge in everyday life. The formation of these competencies begins at the primary education stage.

The development of scientific literacy of primary school students not only improves the quality of teaching natural sciences, but also helps to form their logical thinking, observation, research skills, and environmental culture. Today, international assessment programs such as TIMSS and PISA set important criteria for assessing students' scientific literacy. Uzbekistan's participation in these international studies creates the need to improve the methodology for teaching and assessing natural sciences.

The content of the concept of natural and scientific literacy: Natural and scientific literacy includes such competencies as the student's knowledge of scientific concepts, the ability to explain natural phenomena, analyze scientific data, conduct experiments, solve problems on a scientific basis, and feel ecological responsibility. These competencies are of great importance in the future educational activities and everyday life of students.

The purpose of assessing natural and scientific literacy in primary grades: The main purpose of the assessment is to determine the knowledge and practical skills acquired by students in natural sciences. The assessment also performs the tasks of determining the quality of education, monitoring the dynamics of student development, identifying shortcomings, improving teaching methods, and predicting educational outcomes. A properly organized assessment system helps to increase students' interest in natural sciences.

Assessment of scientific literacy in TIMSS studies: The TIMSS (Trends in International Mathematics and Science Study) international study aims to assess the level of knowledge of students in mathematics and natural sciences. The TIMSS program assesses students' knowledge, application, and reasoning competencies. This approach allows us to determine not only the theoretical knowledge of students, but also their ability to apply knowledge in practical situations.

Methods for assessing scientific literacy are used in practice in 5 different ways. These include:

1. Test tasks - Used to determine knowledge and concepts.
2. Practical tasks - Assess students' experimental and observational skills.
3. Project work - Develops the ability to conduct independent research.
4. Portfolio - Allows you to analyze the long-term results of the student.
5. Observation method - Serves to evaluate students' activities and practical actions in the classroom.

The following assessment tools are considered effective in a digital learning environment: electronic tests, interactive platforms, virtual laboratories, QR-tasks, online monitoring systems. These tools ensure the speed and objectivity of assessment.

In conclusion, the assessment of scientific literacy of primary school students is an important component of the modern education system. The assessment process should cover not only theoretical knowledge, but also practical activities, problem-solving skills and scientific thinking. International assessment programs such as TIMSS and PISA identify important areas for the development of scientific literacy. Therefore, the use of modern assessment methods, the widespread introduction of a competency-based approach and the use of innovative technologies in primary education are urgent tasks.

In the future, by improving the scientific literacy assessment system based on international standards, it is possible to further develop students' scientific outlook, creative thinking and research competencies.

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